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## THE PSYCHOLOGY OF HOBBS AND ITS SOURCES.<sup>1</sup>

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Among the pioneers of English thought in the modern era, the figure of Thomas Hobbes is one of peculiar interest. A clear and vigorous thinker, a man of sturdy and uncompromising mould, he stimulated other minds to challenge as well as to develop the principles he laid down. His influence as conditioning the subsequent development of ethical and political theory is everywhere granted; that he was the founder of English Psychology is, perhaps, not so generally recognized. Certainly we shall not expect to find in Hobbes a complete and perfectly systematized psychology, free from the crudities of pioneer thinking; we shall not forget that the vast field of the physical sciences was, at this period, a newly discovered and as yet, for the most part, unexplored territory. It is the writer's aim, in what follows, to piece together Hobbes' system of psychology from his various works, and to show the connection of his doctrines with prior thought. Our sources are the *Leviathan*, the *De Corpore*, the *De Homine*, and *Human Nature*. All references are to Molesworth's edition of Hobbes' English Works.

Hobbes makes psychology a department of anthropology, or the science of man. Man's nature is the "sum of his natural faculties and powers," and these faculties and powers are further classified as animal and rational, according as they pertain to the body or the mind. (*H. N.* I, 4-5.) Thus, at the start, the subject-matter of psychology is clearly marked off by Hobbes. Psychology deals with man's rational powers in distinction from his bodily powers. The powers of mind are of two sorts, cognitive and motive. The former, which Hobbes terms, also, imaginative or conceptive, is that power by which men get those images or representations of the qualities of external things from which all our knowledge is derived. (*H. N.* I, 7.)

Two points here are worthy of note: and, first, that the attitude of Hobbes is quite strictly non-metaphysical. He is nowhere concerned with the nature of mind as a substance. Sometimes, indeed, he would seem to imply the existence of a substantial

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mind, but oftener he merely assumes mind of some sort, and passes on to the consideration of the mental powers. The second point to be noted is that his method is empirical. He intends, he says, "not to take any principle upon trust, but only to put men in mind of what they know already, or may know by their own experience." (*H. N.* I, 2.) He distinguishes two kinds of knowledge,—knowledge of experience, and knowledge of truth, or science. Both have their origin in sense, however; it is a question only of remoteness from that origin. To quote Hobbes himself: "Both are but experience; the former being but the experience of the effects of things that work upon us from without; and the latter experience men have from the proper use of names in language; and all experience being but remembrance, all knowledge is remembrance." (*H. N.* VI, 1.) Hobbes' method then is to consist in a rational interpretation of sense-data, and this method can itself have no other origin than sense. (Cf. *De Corp.* I, 1, 2; I, 6, 1.)

The study of the cognitive powers begins then with an inquiry into the nature of sense. In the *De Corpore* Hobbes approaches the problem by way of physics, a fact which is significant for his psychological theory, and indicative from the start of the mechanical view which shapes his thought. Of all phenomena, he says, the most wonderful is "that some natural bodies have in themselves the patterns almost of all things, and others of none at all." (*De Corp.* IV, 25, 1.) To the explanation of sense as a property of physical bodies to be accounted for by physical laws, he directs his efforts.

It is the "great deception of sense" that color, shape, sound, and other experiences of the sentient subject seem to be qualities in the object; indeed "the contrary must needs appear a great paradox." What is the truth in the matter is stated by Hobbes with the greatest clearness in four propositions, which reduce to the following. The subject wherein the image is inherent is not the object or thing seen; there is nothing without us that can be called color, or sound, hardness, odor, taste, or the like; the things that really *are* in the world without us are those motions by which the appearances of sense are caused. (*H. N.* II, 4, 10; *De Corp.* IV, 25.) Among the proofs by which the foregoing propositions are established is mentioned the phenomenon of light produced by a blow upon the eye, in which case the sensation obviously corresponds to nothing external save the motion which caused it. That ideas or phantasms are caused by motion is evident, Hobbes reasons, from the fact that they change, now appearing, now vanishing; and all mutation is due to motion.

The cognitive process may be analyzed into three factors or stages. First, an impression made upon an organ of sense by

pressure of some external object, the pressure being exerted either immediately, as in taste and touch, or mediately, as in seeing, hearing, and smelling. Secondly, this motion is continued, by means of the nerves, within the living body to the brain and thence to the heart. Thirdly, this inward motion causes a reaction at the center of life, and "an endeavour outward," which gives rise to the phenomena of sense. This outward endeavor occurs only when the reaction acquires a certain degree of strength; it explains, moreover, the external reference of sensation. A complete definition of sense is, therefore, that it is "a phantasm made by the reaction and endeavor outwards in the organ of sense, caused by an endeavor inwards from the object, remaining for some time, more or less." (*De Corp.* IV, 25, 2. Cf. also *Leviathan* I, 1.) The entire process is mechanical.

Hobbes enumerates five senses: sight, hearing, smell, taste, and touch. These have each its own sense-organ proper, and nerve for the transmission of the impression to the brain, but the internal mechanism—that is, the nerves leading to the heart, the heart itself, and the arteries which connect it with the brain—is common to all. The proper organs of touch are the nerves and membranes dispersed through the whole body. In his brief description of the sense-organs, it is evident that Hobbes was conversant with the physiology of his day, though he found it meager enough for the purposes of his psychology. Under sensations of sight are included light and color, color being "perturbed" light; under touch he mentions hardness and softness, heat and cold, wetness, oiliness, and "many more which are easier to be distinguished by sense than by words." Motion, rest, magnitude, and figure are common to sight and touch; smoothness, roughness, density, and rarity refer to figure, and are therefore likewise common to sight and touch. Sight and hearing are treated with special fullness and intelligence. (*De Corp.* and *De Homine.*) Since the nature of sense consists in motion, but one impression is possible at one and the same time, for the organ cannot be busied with two or more motions at once. Thus if two objects work together, the result will be one sensation compounded of the action of both.

Under the term imagination, Hobbes includes the phenomena of memory-images, of dreams, and of fancy, with a brief notice of after-images. The cause of memory he finds in the fact that the motions excited by the impressions of objects do not immediately cease on the removal of the object, but persist within the organism. This he proves by explicit reference to the law of inertia. (*Lev.* I, 2.) The motions produced by an object that has been removed are gradually obscured or over-

come by new motions, resulting from new impressions upon the organs. The memory-image, then, is "sense decaying" or weakening in the absence of the object. To this decay of sense is due the gradually increasing dimness and vagueness of memory-images, and the dropping out of particulars. Distance in time has an effect similar to that of distance in place, in that the whole grows dim, and loses distinction of parts, while the finer details are lost from sight. (*De Corp.* IV, 25, 7; *Lev.* I, 2; *H. N.* III, 1, 7.)

The phenomena of dreams possess a great charm for Hobbes, and he recurs frequently to the subject in the course of his writings, bringing new bits by way of comment and explanation. The images seen in dreams, he says, "have also been previously before the sense, either totally or by parcels." They differ from memory-images proper, however, in that they are, as it were, centrally excited; they result from motions originated in the heart; as, for example, cold in the internal organs generates fear, and "causeth to dream of ghosts." He notes also the incoherence of dreams, as compared with the experiences of sense, and their frequent absurdity as well.

The phenomena of after-images and of the *Eigenlicht* of the retina did not escape this acute observer, though he classes the latter with the former. "There is yet another kind of imagination which for clearness contendeth with sense, . . . and that is when the action of sense hath been long or vehement; and the experience thereof is more frequent in the sense of seeing than the rest. An example whereof is the image remaining before the eye after looking at the sun. Also those little images that appear before the eyes in the dark . . . are examples of the same." (*H. N.* III, 5.)

Memory has for Hobbes, also, the function of a sort of "sixth sense," or an "internal sense." For by the senses we take notice of the objects without us, "but we take notice, also, in some way or other, of our conceptions; for when the conception of the same thing cometh again, we take notice that it is *again* . . . This, therefore, may be accounted a sixth sense, but internal, and is commonly called remembrance." (*H. N.* III, 6.) And in the *De Corpore*, memory has assigned to it the comparison of images, and the judgments as to likeness or difference. (IV, 25, 7.)

Fancy is distinguished from memory by two factors. It has no reference to the past; and while it draws all its material from sense, fancy arbitrarily combines and rearranges the elements thus given, as when it constructs a centaur or a mountain of gold. (*Lev.* I, 2; *H. N.* III, 4.)

Hobbes has a fairly definite and intelligible theory of Association, and one which follows logically enough from this

explanation of sensation. The succession of ideas may be either casual or orderly. Even in the former case, that of "ranging" thought, the apparently disconnected ideas may often be reduced to order by the discovery of a hidden bond of union. The orderly sequence of ideas, or "discourse of the mind," is the rule in adult mental life, and is directly conditioned by the fact that the original motions arising from the sense-impressions occur in a given order. "We have no transition," he expressly states, "from one imagination to another, whereof we never had the like before in our senses." For all ideas are motions, relics of those made in sense, and those motions that succeeded one another in sense continue together in the same order after sense, "in so much as the former, coming again to take place, and to be predominant, the later followeth by coherence of the matter moved, in such manner as water upon a plane table is drawn any way one part of it is guided by the finger." (*Lev.* I, 3.) But since in experience any given impression is followed now by this impression, now by that other, so in the mental series, association may take one of several directions, and its course cannot be predicted with certainty. This much only is certain, that each member of the series will follow its predecessors in an order at some previous time established in experience. Association by contiguity is then the sole form of association recognized by Hobbes. He does not use the term contiguity, however, or, indeed, that of association. He gives as an example of the succession of ideas the thought of St. Andrew suggested by that of St. Peter. Examples of purposely guided or regulated trains of thought are the retracing in memory a series of events, in order to fix the time and the occasion of the loss of a certain article; the passing from an event to the consequences known by experience to follow from that event, or from an imagined end to the means to that end, are cases to the point. (*H. N.* IV, 2.)

Finally in his discussion of the cognitive powers, Hobbes treats of reason. (Cf. *Lev.* I, 3, 4, 5; *De Corp.* I, 1, 2; *H. N.* IV, V.) This is a subject of peculiar difficulty for him, for since all knowledge is derived from sense, and all association of images follows the order given in sense, reason would seem to be restricted to a narrow sphere of activity. Hobbes' statement is somewhat obscured, moreover, by his differentiation of prudence from reason. By prudence he means simply forecast of the future, based upon experience. It is an accurate linking of cause and effect by means of association. As such, it is not confined to man, but is shown in some measure by animals. Reason is a higher power than prudence; it is not, like sense and memory, born with us, nor yet gained by

experience only, like prudence, but, on the contrary, is attained by industry. It consists first in an apt imposing of names, and secondly, in an orderly method of proceeding from names to their connection in propositions. The mind can have no thought or knowledge not ultimately derived from sense. Everything that is thought is particular; there are no general ideas. Names only are universal; and names are arbitrary symbols invented by man for his convenience in communicating ideas. The formation of propositions by the addition and subtraction of names, is judgment; the further manipulation of propositions into syllogisms is reasoning. Reasoning thus reduces to a form of reckoning. Reason is the peculiar mark by which man is distinguished from the animals. Children have not the power of reason until they have learned the use of speech. They may be called rational creatures, however, since they are capable of acquiring reason.

Hobbes' discussion of pleasure and pain is entirely consistent with his explanation of the cognitive powers, and forms the transition to the motive power. Pleasure and pain form, as it were, another kind of sense; they arise in consequence of the motion propagated from the sense-organs inwards, as do sensations. Motions communicated from without and continued within the body differ, however, according as they reinforce or hinder the vital motion of the organism. A motion which helps vital action is productive of a sense of pleasure, and issues in a reaction or endeavor termed *appetite*. On the contrary, a motion which hinders or impedes vital action gives rise to pain, which is the subjective counterpart of the endeavor termed *aversion*. Here we have, surely, a noteworthy anticipation of later theory. (Cf. *Lev.* I, 6, and *De Corp.* IV, 25, 12.) The internal reference of pleasure and pain is explained by the direction of the primary motion inwards, as the external reference of sensation was explained by the outward motion.

On the basis of pleasure and pain as phenomena accompanied by appetite and aversion,—endeavor towards a good, or away from an evil,—all the passions are explained. Besides the pleasures and pains of sense, are those of expectation, based upon experiences of sense. Hence, from the primitive desire and aversion are derived joy, grief, hope, fear, benevolence, anger, pity, envy, etc. The genesis of some of these is traced out at length, and in a manner which constantly suggests modern English thinkers. This derivation of the passions and emotions from self-regarding impulses has, however, more significance for ethics and politics than for psychology, and need detain us no longer.

From his discussion of pleasure and pain as subjective

aspects of appetite and aversion, Hobbes proceeds to a purely mechanical and deterministic theory of volition. A man is oftentimes in doubt concerning a thing, whether it promises good or threatens evil, and in this case appetite and aversion alternate. Or two objects of desire may be contemplated, one of which must give way to the other. In such cases, the mental state is that of *deliberation*, and the last appetite or aversion, "immediately adhering to the action or to the omission thereof, is that we call the *will*." (*Lev.* I, 6.) In common speech, indeed, we may say a man had a will to do thus and so, but forebore to do it; strictly speaking he had an inclination only. For will is the last appetite in deliberating, and is not divorced from action save by external constraint. Appetite is the internal endeavor or reaction upon some object of desire; will is the issuing of this endeavor in outward action. It makes no essential difference for Hobbes' doctrine that the object of desire may be either real or ideational.

It follows, of course, that the will is determined, and not free; for "where there is appetite the entire cause of appetite hath preceded; and consequently, the act of appetite could not choose but follow, that is, hath of necessity followed. And, therefore, such a liberty as is free from necessity is not to be found in the will either of men or beasts." (*De Corp.* IV, 25, 13.) Or, as it is stated in yet more forcible terms in the essay *Questions Concerning Liberty, Necessity, and Chance*: the choice I shall have of anything hereafter, is now as necessary as that fire will burn any combustible matter thrown into it. (*Eng. Works*, V, 295.)

The distinction between "animal" and "vital" motion corresponds to that between voluntary and non-voluntary action. Examples given of the latter are the circulation of the blood, respiration, nutrition, and other vital processes; of the former, speaking, walking, and the like. Hobbes calls attention to the fact that imagination is a factor in all voluntary motion, since all such motions "depend upon a precedent thought of whither, which way, and what." (*Lev.* I, 6. Cf. *H. N.* XII, 3.)

We have now before us, in brief, the psychology of Hobbes. From our more advanced point of view, it would be easy to point out its flaws and short-comings. Yet the range of mental phenomena included, the acuteness of observation shown in the description and explanation of the phenomena, and the general consistency of Hobbes' views with one or two fundamental principles, combine to produce a fairly clear-cut and comprehensive system. At least we may say that in spirit and aim, psychology begins to present the aspect of modern em-



pirical science. Furthermore, some of the modern problems have been raised, some of the modern solutions anticipated.

In seeking the sources of the psychology of Hobbes, we turn very naturally first to Francis Bacon. We are accustomed to look to Bacon for the beginnings of science; but is it true that psychology owes to him a debt distinct from that shared with her sister sciences? In order to answer this question, let us seek to learn in how far Bacon's writings may be said to contain a psychology, and of what sort it is. Then only shall we be prepared to say to what extent, if any, Hobbes was influenced by it in framing his own system.

In the *De Augmentis* (Bk II, ch. 1) Bacon divides all knowledge into History, Poesy and Philosophy, this division being based upon the psychological analysis of the rational soul into the three faculties, memory, imagination, and reason. History, which includes natural as well as civil history, consists in the last analysis of the facts of experience, first presented to the senses, then stored up in the memory. Poetry pertains to the imagination, by which the images of sense are variously sorted, disjoined, and formed into new and arbitrary combinations. Reason, dealing still with the given of experience, analyzes and classifies its material, and the result is philosophy, —knowledge concerning God, nature and man. History and poetry are thus concerned with individuals, but philosophy discards individuals, "neither does it deal with the impressions immediately received from them, but with abstract notions derived from these impressions; in the composition and division whereof according to the law of nature and of fact, its business lies." Here we have, in the germ, a "faculty"-psychology of a strongly empirical tendency. Knowledge begins with the particulars of sense-experience, and rises by means of the elaboration of these to general principles. (Cf. *Nov. Org.* I, 1; 19-22.)

In his further classification of knowledge, Bacon divides the doctrine of man into the Philosophy of Humanity and Civil Philosophy; under the first of these psychology finds its place, together with physiology. (*De Aug.* IV, 1.) It is somewhat startling to the reader keen for modern problems to find that the inquiry as to the nature of the bond between body and mind assumed for Bacon a place of chief importance. It is not, however, the modern problem which engages him here, but rather that of the sympathetic relation of the mental and the physical sides of man's being.

Bacon accepts from Greek philosophy the division of the soul into rational and irrational. The rational soul is divine, the breath of life breathed into man by God. As such it is incomprehensible and inexplicable, and all questions concerning its

nature belong not to psychology, but to theology. The irrational soul, however,—or, as Bacon also designates it, the “sensible” or “produced” soul—belongs both to man and to the brutes, and this forms a fit subject of human inquiry. “It must clearly be regarded as a corporeal substance, attenuated and made invisible by heat; a breath compounded of the natures of flame and air, having the softness of air to receive impressions, and the vigor of fire to propagate its action; nourished partly by oily, partly by watery substances; clothed with the body, and in perfect animals residing chiefly in the head, running along the nerves, and refreshed and repaired by the spirituous blood of the arteries.” (*De Aug.* IV, 3.)

Bacon is as explicit concerning the functions of the irrational soul as concerning its nature. It is the organ of voluntary motion and of sense. He complains that neither of these powers has been properly investigated; the bare fact that the body is set in motion by the spirit, a substance vastly more subtle than the corporeal mass, is, he urges, a fact surely deserving careful inquiry, but one that has hitherto escaped it. Bacon’s purpose here as elsewhere is rather to outline the problems involved, and to point out the directions which investigation should take, than to give even a tentative solution.

In his treatment of sense and the sensible, Bacon is chiefly concerned with the distinction between sensation and perception. By perception, however, he means something quite different from what that term signifies for modern thought. “Perception,” for Bacon, is common to all bodies, inanimate as well as animate. All bodies, he says, exercise a kind of choice in receiving what is agreeable, and excluding what is hostile or foreign, as for instance when the magnet attracts iron, or two bubbles unite on approaching. Within animate bodies also, certain processes occur which are analogous to the examples just cited, as for instance the beating of the heart, the processes of digestion, etc. (*De Aug.* IV, 3.) All such processes or affections of bodies are, it is urged, to be carefully distinguished from sense. The distinction would seem to be that between unconscious or reflex processes and conscious affections. (See Fowler’s *Introd. to the Nov. Org.*, 18–19; also Kuno Fischer’s *Francis Bacon*, 273–274.) Everywhere in nature, Bacon would show, is found a receptivity for impressions appropriate to the particular body in question. The bit of iron, the chip of wood, the drop of water, each receives or repels according to its nature. Within organic bodies this primal capacity reveals itself in processes of greater complexity. In sensation, the receiving of impressions is accompanied by *consciousness* of that which is received, a new element, and one demanding attention and explanation. “Men have not seen clearly enough

of what nature the action of sense is ; and what kind of body, what length of time, or what repetition of impression is required to produce pleasure or pain. In a word, they do not seem at all to understand the difference between simple perception and sense ; nor how far perception may take place without sense. Neither is this a dispute about words merely, but about a matter of great importance." (*De Aug.* IV, 3.) Thus Bacon summons science to an investigation of the phenomena of sensation.

This discussion of sensation in the *De Augmentis* should be supplemented by certain passages from the *Novum Organum*, wherein Bacon points out that the impressions of sense are faulty, since they both fail us and deceive us, and hence the need of instruments to aid the senses, and of experiment. Furthermore, there is an especial liability to error in passing from sense-impressions to judgments. (*Nov. Org.* I, 50, 69.) The *Idola Tribus* and the *Idola Specus*, tendencies to error grounded respectively in human nature itself and in the peculiar constitution of individuals, have a bearing upon problems of psychology, in that they mark a distinction between sensations within us and things without us, and raise the question as to the nature and correctness of our perceptions, as well as note the fact of individual variations in psychical functioning. (*Nov. Org.* I, 41-42. See also K. Fischer's *Francis Bacon*, 82-83.)

According to Bacon's classification, the understanding and reason are delegated to logic ; the will, affections and appetites to ethics. Logic and ethics, therefore, fall under psychology. Imagination acts as a messenger or proctor in both provinces, carrying over the images of sense for the judgments of reason and the mandates of the will. (*De Aug.* V, 1.) Incidentally he comments upon the part played by imagination in voluntary motion. The image serves as the object and guide of the motion, as proved by the fact that when it is withdrawn the motion is immediately interrupted. As an example he cites the case of a person walking, and brought to a standstill in consequence of absorption in some object of thought.

The faculty of memory is treated briefly in the *De Augmentis* (V, 5), and at greater length in the *Novum Organum* (II, 26). Bacon's discussion of memory is prompted by the practical aim of establishing an effective mnemonics, but has interest as containing some forecast of a theory of association. He enumerates six ways by which memory is facilitated. (1) By cutting off of infinity of search, which may be done by noting the order or distribution, by the artificial assignment of "places" (either places in the proper sense of the word, or any arbitrary sign, as words, letters, historical persons, and the like), or by taking advantage of the rhythm and rhyme of

verse. (2) By the reduction of the intellectual conception to a sensible image. (3) By impression made on the mind in a state of strong emotion. (4) By impression made on the mind when unoccupied with anything else either before or after. (5) By a multitude of circumstances or points to take hold of. (6) By expectation.

The will, as has been said, falls within the sphere of ethics, and is considered by Bacon wholly with a view to practical or moral interests.

Not the least interesting and instructive of Bacon's opinions which have significance for our inquiry, are those found in the *De Augmentis* (VII, 3), where he makes suggestions towards a social psychology. Here he insists that the characters and dispositions of mind be investigated with scientific accuracy, both those which are common to all men, and those which are peculiar and individual. Hitherto astrology alone has concerned itself with this study, and that in a superficial and unscientific manner. He would have a careful investigation now instituted, with a view to ascertaining what are the common and simple elements in mental life, and how these are modified by age, sex, region of country, disease, deformity, station in life, wealth, poverty, prosperity, adversity, and so on. The affections and passions should be included in this research. Philosophers ought carefully and actively, so Bacon says, to have inquired concerning the strength and energy of custom, exercise, habit, education, imitation, emulation, friendship, praise, reproof, and so forth.

So much for Bacon's psychology. To quote Fowler: "It is impossible not to see in these speculations, crude as some of them are, the beginnings of much of the later English psychology." (Fowler's Introduction to the *Nov. Org.*, p. 19.) Bacon gives almost nothing by way of theory; his thought is scarcely systematized. It is not so much a psychology that we find, as suggestions as to what psychology must be. We do not forget that Bacon's service to science in general was not in the form of definite contributions to the sciences, but rather in his insistence on a wider range of investigation, a freer spirit of inquiry, and, above all, a new method. He was the prophet of a new dispensation; gifted with clearer vision than his fellows, he called upon men everywhere to repent of the sins of their enslaved past, and do works meet for such repentance.

In tracing the influence of Bacon upon Hobbes, we find ourselves upon debated ground. The dispute has reference chiefly to the general philosophical influence of Bacon, rather than to the narrower question in which our interest centers, but is not without a bearing upon the matter in hand. Fowler and Kuno

Fischer agree in asserting that Hobbes is the disciple of Bacon, that the thought of the former is rooted in that of the latter, and grows out of it logically and unmistakably. It seems no less certain that other influences, chiefly continental, were at work upon Hobbes, and did much to mould his thought.

But little significance can be attached to the circumstance that in all his writings Hobbes makes but two references to Bacon, and these of a trivial nature. (Nichol's *Bacon* in B. Ph. Classics, Vol. 2, p. 235; Fowler's *Introd. to Nov. Org.*, p. 99.) It is certain that the two men had personal dealings; it seems certain, on the authority of Aubrey, that Bacon employed Hobbes to translate some of his works into Latin, "finding none able so readily to understand his thoughts in them." However this may be, on a *priori* judgment, one would pronounce it to be impossible that Hobbes should have been unacquainted with and uninfluenced by the writings of his distinguished contemporary and fellow-countryman. Bacon's influence upon Hobbes is chiefly a matter of tendency and attitude rather than of direct transmission of doctrine, and for this reason more readily eludes exact definition, while it is not less real and potent.

Perhaps the first thing to be noted in Bacon which has a distinct bearing upon the psychology of Hobbes, is the marking off of the field of psychology from metaphysics. Bacon, we remember, divides the soul into rational and sensible parts. The former, being wholly incomprehensible to human reason, he turns over with cheerful alacrity to theology; the latter furnishes the field of psychology. Thus, at the outset, psychology is guarded in large measure against entanglement with metaphysical questions,—much as we may deprecate the means by which this result is effected. To use Fowler's words: Bacon assumes from the start the ordinary distinction between mind and matter, a universe of objects to be known, and a thinking subject capable, by care and discipline, of attaining to a knowledge of them. (Fowler's *Introd. to Nov. Org.*, p. 16.) Psychology is not concerned with the proof of these presuppositions. It is on the same level with the other sciences in that it has for its aim the investigation of a definite group of phenomena. It was no small service in the interests of psychology thus early to define its sphere and to insure its title to a place among the sciences.

In this dualism of Bacon's, just noted, is to be found, doubtless, one source of the materialism of Hobbes. As Kuno Fischer says, the hiatus between the rational and the sensible soul led logically to the denial of that which is in itself inexplicable, and superfluous for mental life. (*Francis Bacon*, pp. 270-271.) Lange cites as evidence of the materialism of Bacon his high

estimate of Democritus, whose system he places above all others, and also Bacon's doctrine of "animal spirits." Says Lange: "We have the thing (materialism) in all essential respects in Bacon, and we are only restrained from designating Bacon as strictly the restorer of the materialistic philosophy by the circumstance that he fixed his attention almost exclusively upon method." (Lange's *Hist. of Materialism*, I, 236.) Bacon's psychology is virtually materialistic, that of Hobbes frankly and explicitly so.

Along with Bacon's service in defining the field of psychology must be named that other incalculable service of indicating its method. Psychology, as well as the other sciences, must proceed by induction. In the case of psychology no less than of the physical sciences does Bacon bewail the lack of patient and accurate observation and collection of facts. He does not seem to have foreseen the possibility of the application of experiment within the field of psychology, but his spirit is essentially that of modern scientific research. We have already noted that Hobbes proceeds by the empirical method. He does not profess Bacon's disdain for deduction; instead, he combines deduction with induction. He is far too thoroughly imbued with the spirit of Bacon to pass over the importance of facts, or to think he has explained when he has merely described.

In close connection with the above we must note the sensationalism of the psychology of Hobbes. Bacon had insisted upon experience as the sole source of knowledge. But according to his psychology experience is reducible to sensuous elements. The higher processes of thought and inference are, first for Bacon as later for Hobbes, merely means of elaborating the material furnished in sense. Nothing new is added at any stage in knowledge. Words are but arbitrary signs attached to groups of things for convenience of reference. Hence follows "a predilection for a mechanical theory of the universe." (K. F.'s *Francis Bacon*, 412.) Sense holds the same fundamental place in Bacon's psychology as in that of Hobbes. Upon it all higher functions are built, to it they appeal for their entire contents. Bacon shows also, but to a much less marked degree than Hobbes, the tendency to seek in physiology the adequate explanation of psychical phenomena.

To mention some specific and minor points of the indebtedness of Hobbes to his predecessor. Bacon had already emphasized the subjective character of sensation: color, sound, and other sense qualities exist for the sentient subject, not as properties in the object. (*Nov. Org.* I, 41-42.) Bacon's peculiar doctrine of perception as common to all bodies may have some bearing upon Hobbes's mechanical explanation of sensation. If regarded as the extension to the lower forms of organic life

and to inorganic bodies of a property universal in higher organic life, then the doctrine is an anticipation of Leibniz. For Hobbes it may have meant the extension of the mechanical principle ascribed to natural bodies to mental life. We have to look elsewhere, however, for the true source of Hobbes' mechanical conception.

So far as Bacon explains the physiological conditions of sensation, his statements agree with the fuller explanation of Hobbes. Both give to the heart the primacy over the brain as the central organ of sense, for instance. Hobbes certainly owes to Bacon the suggestion that the ideational element enters as a factor into voluntary motion. Bacon's enumeration of the various ways by which memory may be facilitated may well have led Hobbes on to his own theory of association. Bacon is one of the most suggestive of writers on any theme, and in his psychology the reader is impressed by the numerous suggestions thrown out, foregleams of later thought as they seem in retrospect. One cannot state dogmatically that they influenced Hobbes, or subsequent writers. They may very well have done so.

While the continuity of thought from Bacon to Hobbes is too obvious to admit of permanent doubt, it is equally indubitable that the thought of the latter was shaped in no small measure by the action of another current of influence proceeding from the continent, notably from Descartes and that group of scientific thinkers among whom Galileo shone pre-eminently. The key-note of the entire speculation of Hobbes is mechanism. "He finds his mission," says Falckenberg, "in the construction of a strictly mechanical view of the world. Mechanism applied to the world gives materialism ; applied to knowledge, sensationalism of a mathematical type ; applied to the will, determinism ; to morality and the state, ethical and political naturalism." (Falckenberg's *His. Mod. Phil.*, p. 72.) We have seen how thoroughly the mechanical view dominates his psychology. Sensation, memory and imagination, affection and will, are all explained by motion, imparted in the first instance by impact. Motion is the ultimate principle. Motion, in accordance with invariable law and capable of expression in mathematical formulae, was at this period the ruling idea of the new physical science. Mathematicians and astronomers were busy revealing a new heaven and a new earth obedient to laws of motion. What more reasonable than the hope that an idea, proved so fruitful in natural science, would prove equally fruitful applied to the varied phenomena of the life of man? This was the thought that lodged in the mind of Hobbes, grew until it dominated

all his thinking, and expressed itself in his system of philosophy.

That Hobbes did actually come in touch with the men who represented most fully the new scientific movement, is established by the facts of his history; and that he was keenly alive to the significance of their work receives abundant proof from direct statements and references to be found in his writings. During the years 1610-1637, Hobbes made three journeys to the Continent, remaining at one time for a period of three years. He made the acquaintance of Gassendi, Mersenne, and Galileo. These journeys are memorable as occasions of fresh intellectual stimulus. It was on the first of them that he took up for the first time the study of geometry, to which he applied himself with infinite zest. During the third journey the idea of motion took possession of his mind. Day and night he was haunted by it, he tells us; whether he sails, drives, or rides, there motion is forever meeting his eye, engaging his thought, and offering itself as the clue to the mystery of the varied universe. It seemed to him that there is nothing real in the world save motion. (*Vil. carm. exp.* L, I, 89. See, also, Robertson's *Hobbes* in *Bl. Ph. Classics*, pp. 33-34.) Returning in 1637 from his third tour on the Continent, he found England rent by partisans and on the verge of civil war, and, after a brief tarry, went abroad again, remaining this time for eleven years. This period of his exile covers the productive years of the life of Descartes, who was himself an exile in Holland for prudential reasons, but made several visits to France during the time of Hobbes' protracted residence there. Mersenne was in communication with Descartes all the while, and it was through his efforts that Hobbes was induced to add his "objections" to those appended to the *Meditations*, which appeared in 1641. We learn that Descartes was displeased with the tone of Hobbes' criticisms, and would have no further correspondence with their author. (Mahaffy's *Descartes*, *Bl. Ph. Cl.*, p. 95.) Gassendi—of whom Lange says that he was the forerunner of Descartes—was entering upon the period of his greatest literary activity. He became Regius Professor of Mathematics at Paris in 1646, and his lecture-room was crowded with eager hearers. (Lange's *Hist. of Materialism*, I, 263.) Kepler's work had been finished some years before. Galileo was at the height of his fame and activity. His greatest contributions to science had already been made. The law of falling bodies, the diurnal and annual motions of the earth, the ebb and flow of the tide, the discovery and revolution of the satellites of Jupiter,—these and other results of Galileo's research were before the world. Hobbes' own countryman, Harvey, had published his notable



discovery as early as 1628. (*Exercitatio Anatomica de Motu Cordis et Sanguinis.*) It was not until after 1650, subsequent to his return to England, that the chief works of Hobbes appeared in print.

The references made by Hobbes to the scientific thinkers just named are very numerous, being scattered throughout his works, and show him to have been thoroughly familiar with their views. (Notice especially *Epistle Dedicatory, De Corpore.*) An interesting bit of personal history, related by Hobbes himself, tells us how his thoughts were first directed to the problem of sensation, and how he turned at once to motion for the key to the solution. In conversation one day with a group of learned men, some one made mention of sense, and another asked in the spirit of Pilate, "What is sense!" No one being able to answer, he was filled with wonder that men of such wisdom should not understand the nature of their own senses, and from that day he pondered the matter. Then it occurred to him that if bodies and their internal parts were at rest, or were moved always in the same way, there could be no distinction of anything, and consequently no such thing as sense. The cause of all things must be sought in diversity of movements. (*Vita*, L, 1, p. xx. See, also, *Hobbes* in *Bl. Ph. Cl.*, 33-34.)

The influence of Descartes upon the psychology of Hobbes deserves a special consideration. The dualism of Descartes set mind and body over against each other in marked antithesis. On one side, everything is to be explained in terms of thought; on the other, in terms of extension and motion. The rationalistic element in Descartes would seem to have had little interest for or effect upon Hobbes. It is Descartes' use of the mechanical principle which is of chief importance for our problem. Descartes it was who, starting out from the idea of motion, first attempted an explanation of the entire universe on mathematical and mechanical principles. We remember that Descartes himself considered his metaphysical theory merely as preparatory to his scientific and mathematical inquiries. (*Essay on Method*, I, 191, Cousin's ed.) Certain epistemological questions must first be answered. His great aim, however, was to work out a complete and consistent mechanical explanation of all natural phenomena. Descartes' "vortex" theory is an attempt to explain the origin and laws of the solar system in terms of motion. (Cf. Mahaffy's *Descartes*, 159-160; *Descartes and His School*, 400-403; see also Tönnies' *Hobbes, Leben und Lehre*, p. 100.) All the phenomena of nature he believes are to be explained as modes of motion. His earliest published statements of his mechanical theory are the essays on *Meteors* and *Dioptric*.

But the phenomena of the life of man, according to Descartes, are likewise capable of explanation by reference to motion. Life itself is mechanism. Human and animal bodies are automata, wholly explicable by the principles of motion and heat. Sensation and appetite in brutes are mere appearances, physical reactions without correlates in consciousness, and even in man they are mechanical processes. (Cf. *Descartes and his School*, 412.) Here, obviously, is the source of the mechanism which pervades the psychology of Hobbes.

Turning from his general conception of nature to his psychology, we find that Descartes recognized six grades of mental function (Falckenberg's *Hist. Mod. Philos.*, 105): 1. The external senses. 2. The appetites. 3. The passions. 4. The imagination, with its divisions into passive memory and active phantasy. 5. The intellect, or reason. 6. The will. Sensations and appetites, since they belong to the body, are mechanical in origin and nature. They are for Descartes, as for Hobbes, modes of motion. Moreover, since he rejects the idea of action at a distance, Descartes makes all phenomena of motion due to pressure. The passions belong both to body and soul, thus forming a group intermediate between the lower and the higher groups. Mind would not be capable of passion but for the concurrence of the body. The fundamental forms of passion are wonder and desire, the term desire being made to include both the desire to get pleasure, and aversion, or the desire to shun pain. By wonder Descartes seems to mean a state of interest, but neutral as to pleasure and pain. Out of these primary passions all others are elaborated. From pleasure and pain arise desire and aversion; desire and aversion projected into the future are hope and fear; hope and fear realized give rise to joy and grief, and so on. All are strictly self-regarding.

Even this cursory glance at his psychology makes it appear that the profound intellect of Descartes had previously worked over the same ground and arrived at some of the same conclusions as Hobbes. Nor is this to deny to the latter originality of thought. The psychology of Hobbes is no mere resetting of the opinions of Descartes. It has a scent of English soil, and a vigor which testifies to the grappling with problems at first-hand. It is worthy of note, perhaps, that the references of Hobbes to Descartes bear almost without exception upon the speculations of the latter within the field of the physical sciences, but are such as to show familiarity with the details of his thought within that field.

To Bacon, Hobbes would seem to owe his conception of psychology as a science, and the distinctively empirical bent of his

thinking, and to be further indebted to him for various suggestions which he worked out and incorporated in his own system. From Descartes, Hobbes undoubtedly got the conception of nature as a mechanical system, and the idea of the extension of the mechanical principle to physiology and psychology. He went further than Descartes in reducing all mental activity to modes of motion, thus resolving the dualism of Descartes into materialism pure and simple. To the physical sciences of his day, primarily, Hobbes owes the principle by which he explains every form of mental phenomena.

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